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(71) Applicant: **NEC CORP**

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(54) ETCHING METHOD BY MOLECULAR FLOW

(57) Abstract:

PURPOSE: To enable of non-defect anisotropic etching of silicon or silicon nitride by a method wherein a xenon difluoride molecular flow having a directional property is applied onto a substrate having silicon or silicon nitride on the surface.

CONSTITUTION: An etching mask material 11 for xenon difluoride XeF2, such as a silicon dioxide film or a resist film, for instance, is formed on a silicon substrate 12. Next, the etching mask 11 is patterned. Then, a molecular flow 13 of xenon difluoride is applied. The molecular flow of xenon difluoride collides with the silicon substrate and dissociation from the XeF2 to XeF+F occurs thereon. Fluorine is combined with silicon to be SiF4, which is discharged. The silicon substrate 12 undergoes anisotropic etching in the silicon substrate, i.e. the etching depth and side etching thereof, is determined by the characteristics of the molecular flow, i.e. the velocity of the molecular flow and the ratio between an inactive gas, such as an argon gas or a nitrogen gas, used as a carrier gas, and xenon difluoride.